

**(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)**

**(19) World Intellectual Property Organization**  
International Bureau



**(43) International Publication Date**  
**18 April 2002 (18.04.2002)**

**PCT**

**(10) International Publication Number**  
**WO 02/31828 A2**

**(51) International Patent Classification<sup>7</sup>:** **G11B 27/00**, (72) **Inventor:** VAN DER MEULEN, Pieter; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

**(21) International Application Number:** PCT/EP01/11169 (74) **Agent:** SCHOENMAKER, Maarten; Internationaal Octroobureau B.V., Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

**(22) International Filing Date:**  
26 September 2001 (26.09.2001)

**(81) Designated States (national):** CN, JP, KR.

**(25) Filing Language:** English

**(84) Designated States (regional):** European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

**(26) Publication Language:** English

**Published:**

— without international search report and to be republished upon receipt of that report

**(30) Priority Data:**  
09/685,554 10 October 2000 (10.10.2000) US

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**(71) Applicant:** KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).



**WO 02/31828 A2**

**(54) Title:** AUDIO SYSTEM WITH VARIABLE RANDOM-PLAY OPTION

**(57) Abstract:** A video or audio play-back apparatus has a variable random play option to control a degree of randomness of the selections made from a play list.

## Audio system with variable random-play option

### FIELD OF THE INVENTION

The invention relates to a system and method for play-out of audio or video content using a random-play-option.

### 5 BACKGROUND ART

Conventional CD players and jukeboxes allow users to specify their Favorite Track Selections (FTS) and play-lists, and typically also have a random-play option (RPO). The FTS option lets the user pre-select his/her favorites and enables to play-out these tracks only. The RPO is an operational mode of the apparatus wherein tracks are being selected and 10 played in a varying, non-sequential order. Selection in the random-play mode is achieved through, e.g., a random number generator. Examples and implementations of random-play control circuitry are discussed in, e.g., US patents 5,543,925 (Philips), 4,841,506 (Pioneer); 4,899,331 (Pioneer); 4,922,476 (pioneer); 4,949,322 (pioneer) and 5,408,448 (Delco Electronics Corporation), all incorporated herein by reference.

15

### SUMMARY OF THE INVENTION

The RPO operates on a pre-determined play-list, typically the list consisting of the entire inventory currently accessible in the apparatus, e.g., the inventory of tracks of a CD. On the other hand, many songs in the music collection never get played anymore in the 20 FTS mode, even though the user might occasionally like to hear a "non-favorite".

Accordingly, the inventor proposes a variable RPO in CE play-out equipment using a random-access content inventory, such as a CD player, an audio CD jukebox, an MP3 player, a DVD library, etc. The invention provides a hardware or software knob, dial or slider on the equipment that lets the user specify a certain amount of flexibility for the equipment to 25 randomly or systematically play out content segments or tracks in addition to those of the FTS. For example, the knob covers a range 0-100%. A 10% setting allows the machine to add one randomly chosen track that is not on favorite track list, to the current play-out list after playing out 10 favorites. A 50% setting allows every other track to be chosen from the entire selection. A 100% setting represents the traditional fully random play mode. The

selection can be based on a purely random selection, or on a knowledge base ("IF YOU LIKE THIS, YOU PROBABLY ARE GOING TO LIKE THIS TOO.."). In the latter case, the knowledge base can reside on the user's home network as his/her profile or on a remote server possibly on the Web.

5 More generally, the invention relates to equipment, typically CE equipment, for playing out audio or video content, pre-recorded, live, or a mix thereof. The equipment has a user-variable random-play option for control of the playing out to allow a user to determine a frequency of random selection from among the content. Preferably, the equipment allows the user to indicate selections from the content; and the frequency is  
10 chosen with respect to playing out the selections. The selections can be identified based on a user-profile. The invention also relates to a method of enabling playing out pre-recorded content. The method allows a user to determine a frequency of random selection from among the content for control of the playing out.

15 The invention can be implemented using a client-server architecture. A server on, e.g., the Internet supplies streamable content such as personalized video or audio programs based on, e.g., the user's profile. A frequency of randomly chosen programs can be set by the user, for example to create a personalized Electronic Program Guide (EPG), wherein programs of pre-specified or user-profiled topics are alternated with programs randomly chosen from one or more or all other categories to fill up the EPG.

20 The expression "random selection" as used herein is meant to cover "genuinely random" as well as "pseudo-random" and "substantially random" to indicate any mechanism that is perceived by the user to select content in an unbiased manner from a larger collection.

Incorporated herein by reference are the following patent documents:

25 - U.S. serial no. 09/568,932 (attorney docket US 000106) filed 5/11/00 for Eugene Shteyn and Ruud Roth for ELECTRONIC CONTENT GUIDE RENDERS CONTENT RESOURCES TRANSPARENT. This document relates to a data management system on a home network. The system collects data that is descriptive of content information available at various resources on the network. The data is combined in a single  
30 menu to enable the user to select from the content, regardless of the resource. In a more specific example, the data management system combines the data of an EPG with other data for other types of content information, typically within the context of a home entertainment system. The system comprises a data base for representing schedule information associated with scheduled content information from a content provider such as a broadcasting station or

a video-on-demand (VOD) service. In addition, the data base also represents inventory information that is associated with content information available from another resource, e.g., as recorded at the consumer's digital Personal TV Receiver during previous broadcasts, or from a CD or DVD jukebox. Accordingly, this document relates to a general type of guide, referred to as an electronic content guide (ECG).

5 - U.S. serial no. 09/326,506 (attorney docket PHA 23,417) filed 6/4/99 for Pieter van der Meulen for VIRTUAL JUKEBOX. This document relates to a collection management system, or virtual jukebox, for a collection of recordings that is independent of the physical media upon which the material is recorded. The system forms a part of a network that includes storage media and playback devices, and provides an easy to use system for collection cataloging, archiving, and retrieval. In a preferred embodiment, a collection management system resides on a consumer electronic (CE) device, or a personal or home computer (PC), and the collection includes recordings that are stored on one or more hard drives associated with the CE device or the PC. The collection management system includes a user interface that facilitates the retrieval of recordings for playback from one or more storage devices, based on an individual selection of genre, author, and so on. By storing the recordings on a hard disc drive or other mass storage device with an associated disk operating system, immediate access is available to each recording on the drive, and additional drives can be added to the system as new material is added to the collection.

10 - U.S. serial no. 09/345,339 (attorney PHA 23,700) filed 7/1/99 for Mark Hoffberg and Eugene Shteyn for CONTENT-DRIVEN SPEECH- OR AUDIO-BROWSER. This document relates to categorizing resources on the Internet. The Internet is searched in order to find resources that provide streamable audio such as live Internet broadcasts. The resources are identified based on their file extension and are categorized according to, e.g., the natural language or music style. The user is enabled to browse the collection based on textual or musical input.

#### BRIEF DESCRIPTION OF THE DRAWING

The invention is further explained below, by way of example and with reference to the accompanying drawing, wherein Fig.1 is a block diagram of a system in the invention.

#### DETAILED EMBODIMENTS

Fig.1 is a block diagram of a system 100 in the invention. System 100 in this example comprises an audio system that allows selection of music tracks for play out. System 100 comprises a music data base 102, a play-out component 104, and a control system 106 for enabling the user to control a selection of tracks from data base 102, their order for play-out and the play-out mode via component 104. System 106 has a categorized inventory 108 of tracks available to this user. Inventory 108 has categorized the tracks according to, e.g., favorites per genre, and also has an index of all available tracks. Inventory 108 comprises pointers to a sub-set or to all items available in data base 102. The user can provide user-input 110 and 112 to system 106 to select which tracks to play and in what mode. System 106 comprises a track selector 114 that selects the tracks from inventory 108 based on one or more criteria as specified by user input 110 and 112. Selector 114 controls a play-list generator 116 that creates a play-list 118. Play list 118 determines which tracks are selected from data base 102 for being played out by play-out component 104.

Track selector 114 receives an input from a user-interface (UI) 120 that lets the user specify a mode of operation. In this example, UI 120 has options 122, 124 and 126 accessible through, e.g., hard buttons.

Option 122 lets the user activate a play list manually prepared by the user in advance. This option 122 requires that the user have made a manual selection from inventory 108, e.g., via input 110.

Option 124 lets the user control selector 114 to find tracks similar, but not necessarily identical, to the ones in a current play-list. To this end, system 106 has a look-up table or similarity data base 128. For example, CD titles or albums have been categorized as "classical", "romance", "hard-rock", etc. If a classical favorite track list is selected other music categorized as "classical" can be inserted randomly as similar. If system 100 is implemented as a client-server architecture with a remote server on the Internet, system 100 has access to data bases that have been generated by collaborative filtering. These data bases comprise personal recommendations generated by determining a degree of similarity between a user's preferences and that of other people. See, e.g., U.S. patent 5,884,282, herein incorporated by reference. This document relates to an automated collaborative filtering system for recommending at least one item to a first user based on similarity in preference of the user as compared with other users. The filtering system stores rating data for items provided by users of the system. Upon request of the first user, the system determines similarity values for the first user as compared with other users that have provided rating data for items that the first

user has also rated. Based on the similarity values, a subgroup of users is selected that is then used to provide recommendations to the first user.

Option 126 controls the random-play mode. Selector 114 is coupled to a random generator 130 to randomize selection from inventory 108, or from a sub-set thereof.

5 In the invention, the degree of randomness is made variable through a user input 132, here referred to as a fudge knob. Given a current play list 118, the user can introduce a degree of randomness through fudge knob 132. When knob 132 is turned to the "100%" mark, current play list 118 is replaced by a fully random selection from inventory 108, or a from specified sub-set, under control of generator 130. If knob 132 is turned to "0%" play list 118 is

10 processed unaltered. If knob 132 is set to a value in-between, play-list 118 is modified accordingly. The result is that player 104 plays randomly chosen tracks and pre-specified tracks at a ratio represented by the value indicated by the position of fudge knob 132.

System 100 is for example accommodated in single apparatus, or forms a cluster of apparatus in the home. Alternatively, system 100 is a distributed system, e.g., a 15 client-server architecture, wherein the user has play-out device 104 with UI functionalities 120 and 108, and wherein the actual preparation of the play-list and the supply of the music done via a remote server or a cluster of cooperating remote servers, streamed in real time or downloaded in advance to the user's client hard-disk drive (HDD). In the latter case, the selection is performed on the inventory residing on the HDD.

## CLAIMS:

1. An information processing system for making content information available to a user and for allowing the user to determine a degree of random selection from among the content information.
- 5 2. The system of claim 1, wherein:
  - the equipment allows the user to indicate a plurality of selections from the content; and
  - the degree of randomness is chosen with respect to playing out the indicated selections.
- 10 3. The system of claim 1, comprising an audio jukebox.
4. The system of claim 1, implemented in a client-server architecture, wherein preparing the selection is performed on a remote server under control of the user interacting with the client.
- 15 5. The system of claim 1, implemented in a client-server architecture, wherein preparing the selection is performed on the content information downloaded from a remote server onto a user's client.
- 20 6. A method of enabling to supply content information to a user, wherein the method allows the user to vary a degree of random selection from among the content information.
- 25 7. Software for installing on an information processing system a functionality that comprises making content information available to a user and allowing the user to vary a degree of random selection from among the content information.

**(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)**

**(19) World Intellectual Property Organization**  
International Bureau



**(43) International Publication Date**  
18 April 2002 (18.04.2002)

**PCT**

**(10) International Publication Number**  
**WO 02/031828 A3**

**(51) International Patent Classification<sup>7</sup>:** G11B 27/00,  
19/02, G06F 17/30, 17/60, G07F 17/30

**(74) Agent:** SCHOENMAKER, Maarten; Internationaal Oc-  
troobureau B.V., Prof. Holstlaan 6, NL-5656 AA Eind-  
hoven (NL).

**(21) International Application Number:** PCT/EP01/11169

**(81) Designated States (national):** CN, JP, KR.

**(22) International Filing Date:**  
26 September 2001 (26.09.2001)

**(84) Designated States (regional):** European patent (AT, BE,  
CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
NL, PT, SE, TR).

**(25) Filing Language:** English

**Published:**

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

**(26) Publication Language:** English

**(88) Date of publication of the international search report:**  
10 October 2002

**(30) Priority Data:**  
09/685,554 10 October 2000 (10.10.2000) US

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**(71) Applicant:** KONINKLIJKE PHILIPS ELECTRON-  
ICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA  
Eindhoven (NL).

**(72) Inventor:** VAN DER MEULEN, Pieter; Prof. Holstlaan  
6, NL-5656 AA Eindhoven (NL).

WO 02/031828 A3

**(54) Title:** AUDIO SYSTEM WITH VARIABLE RANDOM-PLAY OPTION

**(57) Abstract:** A video or audio play-back apparatus has a variable random play option to control a degree of randomness of the selections made from a play list.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/11169

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 G11B27/00 G11B19/02 G06F17/30 G06F17/60 G07F17/30

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 7 G11B G07F G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 199 04 007 A (WEGGERLE ALEXANDER) 3 August 2000 (2000-08-03) column 1, line 59 - line 67	1-4,6,7
Y	column 2, line 25 - line 49 ---	5
Y	US 6 031 797 A (DOUMA PETER ET AL) 29 February 2000 (2000-02-29) the whole document	5
A	---	1-4,6,7
X	DE 197 01 057 C (BOSCH GMBH ROBERT) 6 August 1998 (1998-08-06) the whole document	1,3,6
A	---	4
	-/-	

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*&\* document member of the same patent family

Date of the actual completion of the international search

9 August 2002

Date of mailing of the international search report

19/08/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
 Fax: (+31-70) 340-3016

Authorized officer

Daalmans, F

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/EP 01/11169

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 99 64969 A (KONINKL PHILIPS ELECTRONICS NV ;PHILIPS SVENSKA AB (SE)) 16 December 1999 (1999-12-16) cited in the application the whole document ---	1-5
A	WO 97 05616 A (SONY ELECTRONICS INC) 13 February 1997 (1997-02-13) page 7, line 15 -page 12, line 13 ---	1-5,7
A	US 5 995 094 A (PAUWS STEFEN C ET AL) 30 November 1999 (1999-11-30) the whole document ---	1-3,6,7
A	US 4 841 506 A (NAKAMURA KAZUNARI ET AL) 20 June 1989 (1989-06-20) cited in the application the whole document ---	1-3,6
A	US 5 408 448 A (CARMAN DAN D) 18 April 1995 (1995-04-18) cited in the application the whole document ---	1-3,6
P,A	WO 01 03000 A (KONINKL PHILIPS ELECTRONICS NV) 11 January 2001 (2001-01-11) cited in the application the whole document -----	1,2,4,5, 7

## INTERNATIONAL SEARCH REPORT

### Information on patent family members

**International Application No.**

PCT/EP 01/11169

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
DE 19904007	A	03-08-2000	DE	19904007 A1		03-08-2000
US 6031797	A	29-02-2000	NONE			
DE 19701057	C	06-08-1998	DE	19701057 C1		06-08-1998
			CZ	9902465 A3		15-12-1999
			WO	9832131 A1		23-07-1998
			EP	0962018 A1		08-12-1999
			HU	0000632 A2		28-06-2000
			JP	2001510614 T		31-07-2001
WO 9964969	A	16-12-1999	EP	1034501 A2		13-09-2000
			WO	9964969 A2		16-12-1999
			JP	2002517862 T		18-06-2002
WO 9705616	A	13-02-1997	US	5751672 A		12-05-1998
			AT	192879 T		15-05-2000
			AU	700004 B2		17-12-1998
			AU	6344896 A		26-02-1997
			CA	2227519 A1		13-02-1997
			CN	1192285 A		02-09-1998
			DE	69608281 D1		15-06-2000
			DE	69608281 T2		30-11-2000
			EP	0840927 A1		13-05-1998
			HK	1007910 A3		30-04-1999
			JP	11514482 T		07-12-1999
			WO	9705616 A1		13-02-1997
			US	6388958 B1		14-05-2002
			US	6247022 B1		12-06-2001
			US	2001056424 A1		27-12-2001
			US	2001004338 A1		21-06-2001
			US	6147940 A		14-11-2000
			US	6128255 A		03-10-2000
			US	2001056430 A1		27-12-2001
			US	6128625 A		03-10-2000
US 5995094	A	30-11-1999	EP	0824826 A2		25-02-1998
			WO	9733424 A2		12-09-1997
			JP	11506250 T		02-06-1999
US 4841506	A	20-06-1989	JP	1826829 C		28-02-1994
			JP	63087685 A		18-04-1988
			JP	1826830 C		28-02-1994
			JP	63087641 A		18-04-1988
			JP	1826831 C		28-02-1994
			JP	63087642 A		18-04-1988
			JP	7052553 B		05-06-1995
			JP	63087649 A		18-04-1988
			JP	1826832 C		28-02-1994
			JP	63087686 A		18-04-1988
			JP	1826833 C		28-02-1994
			JP	63087687 A		18-04-1988
			DE	3733251 A1		05-05-1988
			DE	3744909 C2		25-06-1992
			US	4922476 A		01-05-1990
US 5408448	A	18-04-1995	NONE			

INTERNATIONAL SEARCH REPORT  
Information on patent family members

International Application No  
PCT/EP 01/11169

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0103000	A 11-01-2001	WO 0103000 A2	11-01-2001